

Claims

1. A liquid crystal display apparatus comprising:

a liquid crystal display panel for displaying an image; and

5 a touch panel including i) a first retardation member being disposed on an upper surface of the liquid crystal display panel, ii) a first transparent electrode disposed on the first retardation member iii) a second transparent electrode separated from the first transparent electrode by a predetermined distance, iv) a second retardation member disposed on the second transparent electrode, and v) a first
10 polarizing member disposed on the second retardation member, and the touch panel detecting a point where the first transparent electrode is electrically connected to the second transparent electrode to detect a position of an object that touches an outer surface of the touch panel.

15 2. The liquid crystal display apparatus of claim 1, wherein the first retardation member is a $\lambda/4$ retardation film, and the second retardation member is a $\lambda/2$ retardation film.

20 3. The liquid crystal display apparatus of claim 2, wherein a first retardation axis of the first retardation member forms a first angle between about 90° and about 180° with respect to a polarizing axis of the first polarizing member, and a second retardation axis of the second retardation member forms a second angle between about 45° and about 135° with respect to the polarizing axis of the first polarizing member.

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4. The liquid crystal display apparatus of claim 1, wherein the touch panel further includes a spacer disposed between the first and second transparent

electrodes, the spacer having a diameter from about 10 μ m to about 80 μ m and a height from about 2 μ m to about 10 μ m.

5 5. The liquid crystal display apparatus of claim 1, wherein the liquid crystal display panel further includes a hard coated film, disposed on the first polarizing member, for protecting the first polarizing member.

10 6. The liquid crystal display apparatus of claim 1, wherein the liquid crystal display panel further includes a reflection protection film, disposed on the first polarizing member, for preventing a light from being reflected from a surface of the first polarizing member.

7. The liquid crystal display apparatus of claim 6, wherein the reflection protection film has a Mohs hardness of no less than about 3.

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8. The liquid crystal display apparatus of claim 1, wherein the touch panel further includes:

a hard coated film, disposed on the first polarizing member, for protecting the first polarizing member; and

20 a reflection protection film, disposed on the hard coated film, for removing a light reflected from a surface of the hard coated film.

9. The liquid crystal display apparatus of claim 1, wherein the liquid crystal display apparatus further includes:

25 a third retardation member disposed on a lower surface of the liquid crystal display panel;

a fourth retardation member disposed on a lower surface of the third

retardation member; and

a second polarizing member disposed on a lower surface of the fourth retardation member.

5 10. The liquid crystal display apparatus of claim 9, wherein the first and third retardation members are $\lambda/4$ retardation films, and the second and fourth retardation members are $\lambda/2$ retardation films.

10 11. The liquid crystal display apparatus of claim 9, wherein the first, second, third and fourth retardation members comprise polyarylate.

12. The liquid crystal display apparatus of claim 2, wherein the first and third retardation members comprise polyether sulfone.

15 13. A liquid crystal display apparatus comprising:
a liquid crystal display panel for displaying an image; and
a touch panel including i) a first transparent electrode disposed on an upper surface of the liquid crystal display panel, ii) a second transparent electrode separated from the first transparent electrode by a predetermined distance, iii) a first
20 retardation member disposed on the second transparent electrode, iv) a second retardation member disposed on the first retardation member, and v) a first polarizing member disposed on the second retardation member, and the touch panel detecting a point at which the first transparent electrode is electrically connected to the second transparent electrode to detect a position of an object that touches an
25 outer surface of the touch panel.

14. The liquid crystal display apparatus of claim 13, wherein the first

retardation member is a $\lambda/2$ retardation film, and the second retardation member is a $\lambda/4$ retardation film.

15. The liquid crystal display apparatus of claim 14, wherein a first
5 retardation axis of the first retardation member forms a first angle between about 90°
and about 180° with respect to a polarizing axis of the first polarizing member, and a
second retardation axis of the second retardation member forms a second angle
between about 45° and about 135° with respect to the polarizing axis of the first
polarizing member.

10 16. The liquid crystal display apparatus of claim 13, wherein the liquid
crystal display apparatus further includes:

a third retardation member disposed on a lower surface of the liquid crystal
display panel;

15 a fourth retardation member disposed on a lower surface of the third
retardation member; and

a second polarizing member disposed on a lower surface of the fourth
retardation member.

20 17. The liquid crystal display apparatus of claim 13, wherein the first and
third retardation members are $\lambda/4$ retardation films, and the second and fourth
retardation members are $\lambda/2$ retardation films.

18. A liquid crystal display apparatus comprising:

25 a liquid crystal display panel for displaying an image; and

a touch panel including i) a first transparent electrode disposed on an upper

surface of the liquid crystal display panel, ii) a second transparent electrode separated from the first transparent electrode by a predetermined distance, iii) an optical film disposed on the second transparent electrode, iv) a first polarizing member disposed on the optical film, and v) a spacer disposed between the first and second transparent electrodes, and the touch panel detecting a point at which the first transparent electrode is electrically connected to the second transparent electrode to detect a position of an object that touches an outer surface of the touch panel.

10 19. The liquid crystal display apparatus of claim 18, wherein the liquid crystal display apparatus further includes a second polarizing member disposed on a lower surface of the liquid crystal display apparatus.